IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

Please AMEND claims 1, 13, 18, and 21 and ADD new claim 24 in accordance with the following:

1. (Currently Amended) A channel search device, comprising:

a quasi-synchronization quadrature detector for inputting a PSK modulation signal and a carrier frequency set value, and outputting an I-axis signal and a Q-axis signal obtained by performing, based on the carrier frequency set value, quasi-synchronization quadrature detection on the PSK modulation signal;

a timing reproducer for inputting the I-axis signal, the Q-axis signal, and a symbol rate set value, and reproducing and outputting the I-axis signal and the Q-axis signal while correcting an error of the symbol rate set value;

a dispersion detector for inputting the I-axis signal and the Q-axis signal outputted by said timing reproducer, and detecting and outputting a dispersion between an amplitude of a symbol, comprising the I-axis signal and the Q-axis signal, and a reference amplitude; and

a judging unit for monitoring the dispersion while varying the carrier frequency set value and the symbol rate set value, and judging that a channel exists at a position of a current symbol rate set value and a current carrier frequency set value when the size of the dispersion detected by said dispersion detector becomes an extremal value.

2. (Original) The channel search device according to claim 1, further comprising:

an A/D converter for converting the I-axis signal and the Q-axis signal outputted by said quasi-synchronization quadrature detector respectively from an analog format to a digital format,

wherein said timing reproducer reproduces the I-axis signal and the Q-axis signal in digital formats.

3. (Original) The channel search device according to claim 2,

wherein said timing reproducer reproduces and outputs the I-axis signal and the

Q-axis signal while correcting the error of the symbol rate set value and outputs a displacement amount of the symbol rate, and

wherein said judging unit judges that a channel exists at a position of the symbol rate when the size of the dispersion becomes an extremal value and at a position of the symbol rate according to the displacement amount outputted by said timing reproducer.

4. (Original) The channel search device according to claim 3, further comprising:

a gain controller for outputting a gain control signal according to the difference between the amplitude of the symbol, comprising the I-axis signal and the Q-axis signal outputted by said A/D converter or by said timing reproducer, and the reference amplitude,

wherein said quasi-synchronization quadrature detector amplifies an input of the PSK modulation signal according to the gain control signal.

5. (Original) The channel search device according to claim 1,

wherein said timing reproducer reproduces and outputs the I-axis signal and the Q-axis signal while correcting the error of the symbol rate set value and outputs a displacement amount of the symbol rate, and

wherein said judging unit judges that a channel exists at a position of the symbol rate when the size of the dispersion becomes an extremal value and at a position of the symbol rate according to the displacement amount outputted by said timing reproducer.

6. (Original) The channel search device according to claim 1, further comprising:

a gain controller for outputting a gain control signal according to the difference between the amplitude of the symbol, comprising the I-axis signal and the Q-axis signal outputted by said timing reproducer, and the reference amplitude,

wherein said quasi-synchronization quadrature detector amplifies an input of the PSK modulation signal according to the gain control signal.

7. (Original) The channel search device according to claim 1, further comprising:

a carrier reproducer for correcting phase errors of the I-axis signal and the Q-axis signal outputted by said timing reproducer, and outputting a displacement amount of the carrier frequency set value;

an error corrector for correcting an error of a symbol comprising the I-axis signal and the Q-axis signal corrected by said carrier reproducer; and a synchronization detector for detecting a synchronization by detecting a unique word from a data row of the symbol whose error is corrected by said error corrector,

wherein said judging unit, after the judgment, outputs the carrier frequency set value and the symbol rate set value of which the channel exists to said quasi-synchronization quadrature detector and said timing reproducer, and judges that a channel exists at a position of the symbol rate of the symbol rate set value and the carrier frequency according to the carrier frequency set value and the displacement amount outputted by said carrier reproducer when said synchronization detector detects the synchronization.

8. (Original) The channel search device according to claim 7, further comprising:

an A/D converter for converting the I-axis signal and the Q-axis signal outputted by said quasi-synchronization quadrature detector respectively from an analog format to a digital format,

wherein said timing reproducer reproduces the I-axis signal and the Q-axis signal in digital formats.

9. (Original) The channel search device according to claim 8,

wherein said timing reproducer reproduces and outputs the I-axis signal and the Q-axis signal while correcting the error of the symbol rate set value and outputs a displacement amount of the symbol rate, and

wherein said judging unit judges that a channel exists at a position of the symbol rate when the size of the dispersion becomes an extremal value and at a position of the symbol rate according to the displacement amount outputted by said timing reproducer.

10. (Original) The channel search device according to claim 9, further comprising:

a gain controller for outputting a gain control signal according to the difference between the amplitude of a symbol, comprising the I-axis signal and the Q-axis signal outputted by said A/D converter, by said timing reproducer, or by said carrier reproducer, and the reference amplitude,

wherein said quasi-synchronization quadrature detector amplifies an input of the PSK modulation signal according to the gain control signal.

11. (Original) The channel search device according to claim 7, wherein said dispersion detector performs a channel search, when said judging unit judges the existence of a channel,

by inputting the I-axis signal and the Q-axis signal outputted by said timing reproducer and detecting the dispersion between the amplitude of the symbol, comprising the I-axis signal and the Q-axis signal, and the reference amplitude, and detects noise, when noise detection is instructed, by inputting the I-axis signal and the Q-axis signal corrected by said carrier reproducer and detecting the dispersion between the amplitude of the symbol, comprising the I-axis signal and the Q-axis signal, and the reference amplitude.

12. (Original) The channel search device according to claim 7,

wherein said carrier reproducer corrects, when an enable signal is inputted, phase errors of the I-axis signal and the Q-axis signal outputted by said timing reproducer and outputs the corrected signals, and outputs, when the enable signal is not inputted, the I-axis signal and the Q-axis signal outputted by said timing reproducer as they are,

wherein said dispersion detector inputs the output of said carrier reproducer, and integrates the absolute value of the difference between the amplitude of an inputted symbol and the reference amplitude, and

wherein said judging unit monitors the dispersion detected by said dispersion detector while varying the carrier frequency set value and the symbol rate set value in a state that the enable signal is not inputted to said carrier reproducer, judges that a channel exists at a position of a current symbol rate set value and a current carrier frequency set value when the size of the dispersion becomes an extremal value, thereafter outputs the carrier frequency set value and the symbol rate set value of which the channel exists to said quasi-synchronization quadrature detector and said timing reproducer in a state that the enable signal is inputted to said carrier reproducer, and judges that a channel exists at a position of the symbol rate of the symbol rate set value and the carrier frequency according to the carrier frequency set value and to the displacement amount outputted by said carrier reproducer when said synchronization detector detects the synchronization.

13. (Currently Amended) The channel search device according to claim 12, wherein said dispersion detector inputs, when noise detection is ~~instructed~~activated, the I-axis signal and the Q-axis signal corrected by said carrier reproducer in a state that the enable signal is inputted to said carrier reproducer, and detects noise by detecting the dispersion between the amplitude of the symbol, comprising the I-axis signal and the Q-axis signal, and the reference amplitude.

14. (Original) The channel search device according to claim 13, wherein the noise

detection is C/N detection.

15. (Original) The channel search device according to claim 14, further comprising:

an A/D converter for converting the I-axis signal and the Q-axis signal outputted by said quasi-synchronization quadrature detector respectively from an analog format to a digital format,

wherein said timing reproducer reproduces the I-axis signal and the Q-axis signal in digital formats.

16. (Original) The channel search device according to claim 15,

wherein said timing reproducer reproduces and outputs the I-axis signal and the Q-axis signal while correcting the error of the symbol rate set value and outputs a displacement amount of the symbol rate, and

wherein said judging unit judges that a channel exists at the position of the symbol rate when the size of the dispersion becomes an extremal value and at the position of the symbol rate according to the displacement amount outputted by said timing reproducer.

17. (Original) The channel search device according to claim 16, further comprising:

a gain controller for outputting a gain control signal according to the difference between the amplitude of the symbol, comprising the I-axis signal and the Q-axis signal outputted by said A/D converter, by said timing reproducer, or by said carrier reproducer, and the reference amplitude,

wherein said quasi-synchronization quadrature detector amplifies an input of the PSK modulation signal according to the gain control signal.

18. (Currently Amended) A channel search device, comprising:

a quasi-synchronization quadrature detector for inputting a PSK modulation signal and a carrier frequency set value, and outputting an I-axis signal and a Q-axis signal obtained by performing, based on the carrier frequency set value, quasi-synchronization quadrature detection on the PSK modulation signal;

a timing reproducer for inputting the I-axis signal, the Q-axis signal, and a symbol rate set value, and reproducing and outputting the I-axis signal and the Q-axis signal while correcting an error of the symbol rate set value;

a carrier reproducer for correcting phase errors of the I-axis signal and the Q-axis signal outputted by said timing reproducer, and outputting a displacement amount of the carrier frequency set value;

an amplitude comparator to which the output of said carrier reproducer is inputted, for outputting the difference between an amplitude of an inputted symbol and a reference amplitude;

a gain controller for generating a gain control signal for amplifying the PSK modulation signal inputted to said quasi-synchronization quadrature detector by integrating positive/negative values of an output of said amplitude comparator;

a dispersion detector for detecting and outputting a dispersion between the amplitude of the symbol and the reference amplitude by integrating the absolute value of the output of said amplitude comparator;

an error corrector for correcting an error of a symbol comprising the I-axis signal and the Q-axis signal corrected by said carrier reproducer;

a synchronization detector for detecting a synchronization by detecting a unique word from a data row of the symbol whose error is corrected by said error corrector ; and

a judging unit for monitoring the dispersion detected by said dispersion detector while varying the carrier frequency set value and the symbol rate set value in a state that an enable signal is not inputted to said carrier reproducer, judging that a channel exists at a position of a current symbol rate set value and a current carrier frequency set value when the size of the dispersion becomes an extremal value, thereafter outputting the carrier frequency set value and the symbol rate set value of which the channel exists to said quasi-synchronization quadrature detector and said timing reproducer in a state that the enable signal is inputted to said carrier reproducer, and judging that a channel exists at a position of the symbol rate of the symbol rate set value and the carrier frequency according to the carrier frequency set value and to the displacement amount outputted by said carrier reproducer when said synchronization detector detects the synchronization.

19. (Original) The channel search device according to claim 18, further comprising:

an A/D converter for converting the I-axis signal and the Q-axis signal outputted by said quasi-synchronization quadrature detector respectively from an analog format to a digital format,

wherein said timing reproducer reproduces the I-axis signal and the Q-axis signal in digital formats.

20. (Original) The channel search device according to claim 19,

wherein said timing reproducer reproduces and outputs the I-axis signal and the Q-axis signal while correcting the error of the symbol rate set value and outputs a displacement amount of the symbol rate, and

wherein said judging unit judges that a channel exists at the position of the symbol rate when the size of the dispersion becomes an extremal value and at the position of the symbol rate according to the displacement amount outputted by said timing reproducer.

21. (Currently Amended) The channel search device according to claim 1, wherein said judging unit varies a variation ~~for varying the~~ of the symbol rate set value according to the symbol rate set value.

22. (Original) The channel search device according to claim 1, wherein said judging unit varies a variation for varying the carrier frequency set value according to the symbol rate set value.

23. (Original) The channel search device according to claim 1, wherein said judging unit sets, according to the symbol rate set value, a period for monitoring a dispersion value detected by said dispersion detector while varying the carrier frequency set value and the symbol rate set value.

24. (New) A method for shortening a time period for channel search, comprising:

monitoring dispersion while varying a carrier frequency set value and a symbol rate set value; and

judging that a channel exists at a position of a current symbol rate set value and a current carrier frequency set value when the size of the dispersion becomes an extremal value.